Cambridge Assessment International Education

Mathematics

Stage 8

Paper 2 **2022**

Cambridge Lower Secondary Progression Test

Name

Class

Date

1 hour

Additional materials: Calculator
Geometrical instruments
Tracing paper (optional)

INSTRUCTIONS

- Answer **all** questions.
- Write your answer to each question in the space provided.
- You should show all your working on the question paper.
- You may use a calculator.

INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

1 x is an **integer** such that $x < 8$

Write down **two** possible values of x.

$x =$ ..... or $x =$ ..... [1]

2 Write down the order of rotational symmetry of a regular hexagon.

..... [1]

3 Draw a ring around the letter that is the subject of the formula $at - v = u$.

a t u v

[1]

4 A bag contains counters that are red or green or blue.
A counter is picked at random.
The probabilities of picking each colour are shown in the table.

Red	Green	Blue
0.05	0.3	0.65

Find the probability of **not** picking a blue counter.

..... [1]

5 Put a tick (✓) next to **each** of the correct statements about quadrilaterals.

All squares are rectangles. ☐

All rhombuses are squares. ☐

All parallelograms are rhombuses. ☐

All rectangles are parallelograms. ☐

[1]

6 Jamila and Yuri both correctly work out the answer to $4\frac{3}{8} + 2\frac{3}{5}$ without a calculator.

Here is their working.

Jamila's working	Yuri's working
$4\frac{3}{8} + 2\frac{3}{5}$	$4\frac{3}{8} + 2\frac{3}{5}$
$= \frac{35}{8} + \frac{13}{5}$	$= 4 + 2 + \frac{3}{8} + \frac{3}{5}$
$= \frac{175}{40} + \frac{104}{40}$	$= 6 + \frac{15}{40} + \frac{24}{40}$
$= \frac{279}{40}$	$= 6\frac{39}{40}$
$= 6\frac{39}{40}$	

Yuri's method has fewer steps than Jamila's method for this calculation.

Give **another** advantage of using Yuri's method rather than Jamila's method.

.....

..... [1]

7 The total cost of hiring a bike is worked out like this.

A fixed cost of \$35 **and** an additional charge of \$20 for each day.

Write a formula for the total cost, \$$C$, to hire the bike for d days.

..... [1]

8 The function $y = 2x - 4$ can be represented by this function machine.

Input (x) → ☐ → ☐ → Output (y)

(a) Complete the function machine. [1]

(b) Complete the table for the function $y = 2x - 4$

Input (x)	**Output (y)**
–3.5	
	11

[2]

9 Complete these sentences.

792 344 correct to three significant figures is .....

0.39523 correct to two significant figures is .....

[2]

10 **(a)** Ahmed has a box containing 154 pencils that are yellow, green or blue.
The ratio of yellow to green to blue pencils is $2:5:7$

Work out the number of green pencils in the box.

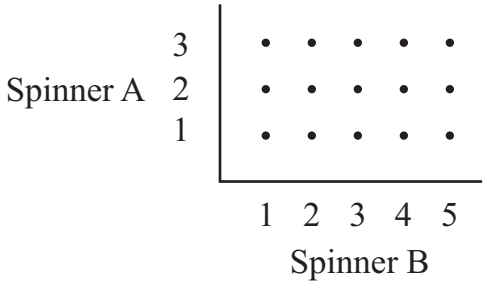
..... [2]

(b) Ahmed also has two boxes of pens.
Both boxes contain red and black pens only.
The table gives some information about the colours.

	Ratio of red to black pens	**Proportion of red pens**
Box 1	$2:7$	
Box 2		$\frac{3}{10}$

Complete the table. [2]

11 **(a)** Hassan has two fair spinners.
Spinner A has three sections numbered 1, 2 and 3
Spinner B has five sections numbered 1, 2, 3, 4 and 5
Hassan spins both spinners.
He draws this possibility diagram.



Find the probability of spinning

(i) the same number on both spinners,

..... [1]

(ii) a higher number on spinner B than on spinner A.

..... [1]

(b) Hassan also has four other spinners, C, D, E and F.
Each of these spinners has four sections numbered 1, 2, 3 and 4
He spins each spinner a total of 200 times and records the number of times he spins the number 3

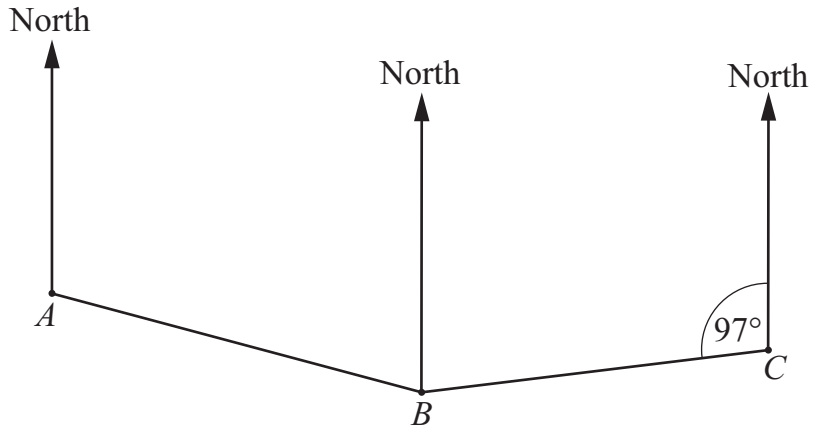
Spinner	C	D	E	F
Number of times he spins 3	82	46	37	65

Only one of these is a fair spinner.

Write the letter of the spinner that is most likely to be fair.

..... [1]

12 The diagram shows a map with three villages, A, B and C.



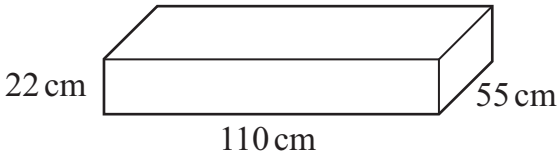
(a) Measure the bearing of B from A.

.....° [1]

(b) Work out the bearing of B from C.

.....° [1]

13 Oliver has this cuboid.



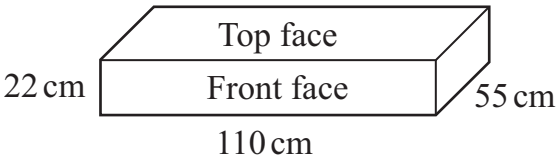
NOT TO SCALE

(a) He wants to paint all six faces of the cuboid.
He uses paint at the rate of 65 m*l* per 2000 cm^2.
Paint comes in tins of 0.5 *l*.

Show that he needs to buy 2 tins of paint.

[3]

(b)



NOT TO SCALE

Oliver makes a 2D scale drawing of the net of the cuboid.
He draws the front face as a rectangle measuring 1.1 cm by 5.5 cm.

Work out the size that he draws the top face of the cuboid.

A rectangle measuring ..... cm by ..... cm [1]

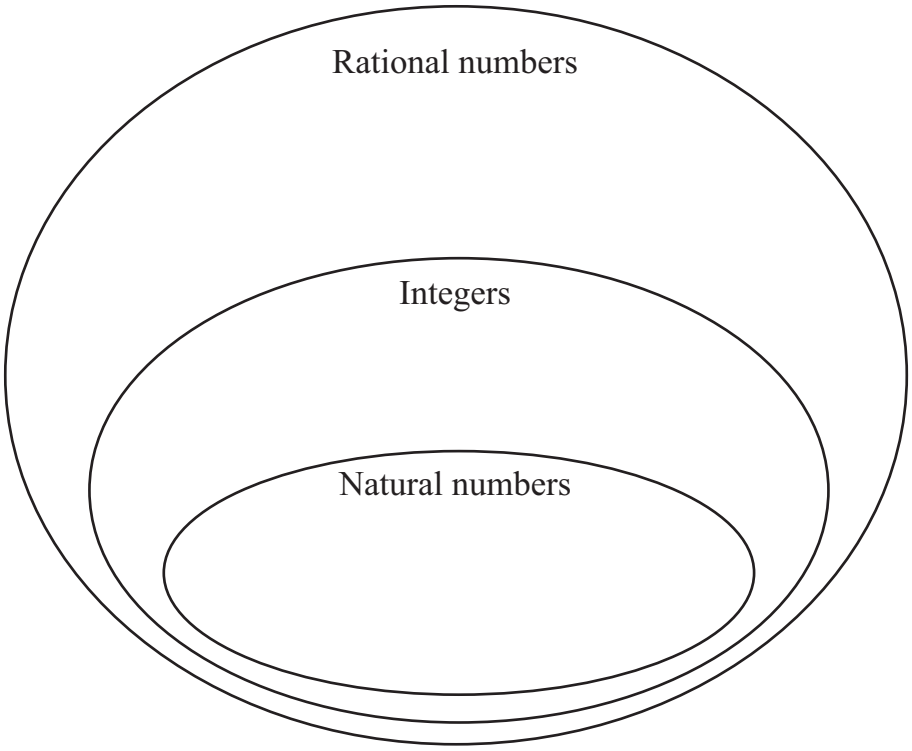
14 A sequence has the term-to-term rule add $1\frac{1}{2}$

The 4th term of the sequence is 7

Find the 8th term of the sequence.

..... [1]

15 Here is a Venn diagram.

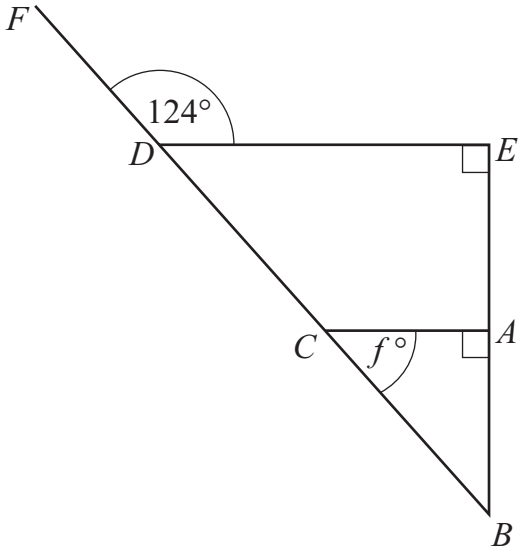


Write each of these numbers in the correct place on the Venn diagram.

-3 0.32 7 192.7 $\frac{1}{5}$ 350

[2]

16 The diagram shows two right-angled triangles *ABC* and *EBD* and a straight line *BCDF*.



NOT TO SCALE

Work out the size of angle *f*.
Give a geometrical reason for **each** step in your working.

f = ... ° because .....

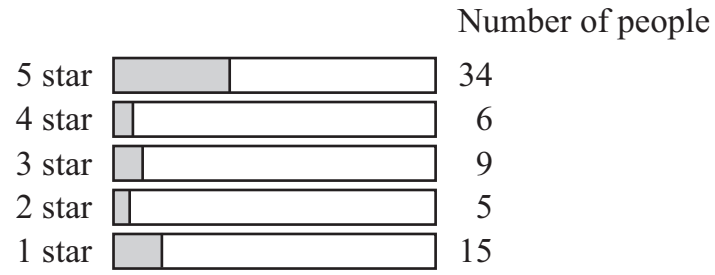
.....

..... [3]

17 Make *m* the subject of the formula $t = 5(m - 3)$

m = ... [2]

18 Lily sells toys on an online shopping site.
Here is the star rating for one of the toys she sells.



Lily calculates the average number of stars for this toy.
Using the mean, this is 3.6 stars.

Lily wants to use an average that gives a higher value than 3.6 stars.

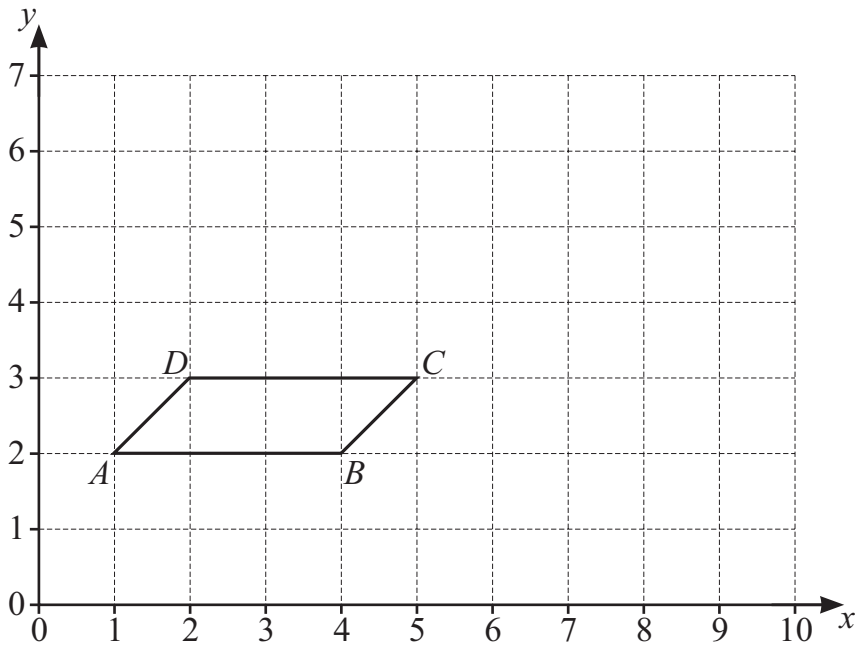
Complete these sentences.

The **highest** average Lily could use is the ..... and the value of this average is ..... stars.

A **different** average Lily could use is the ..... and the value of this average is ..... stars.

[2]

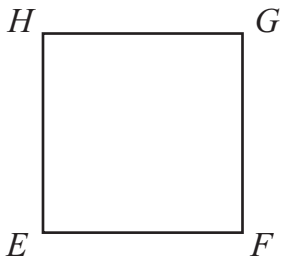
19 The diagram shows parallelogram $ABCD$ on a grid.



(a) Draw the enlargement of parallelogram $ABCD$ with centre of enlargement $(1, 0)$ and scale factor 2

[2]

(b) Here is square $EFGH$.



NOT TO SCALE

$EFGH$ is drawn on a grid so that E is at $(17, 30)$ and H is at $(17, 33)$.
$EFGH$ is then translated 3 right and 4 up.

Draw a ring around the **two** coordinates that are vertices of the square after this translation.

$(20, 34)$ $(17, 34)$ $(23, 37)$ $(17, 37)$ $(23, 40)$ $(20, 40)$

[1]

20 Students from Class P and Class Q were asked to solve a puzzle.
The time, in seconds, to solve the puzzle is recorded for each student.
The stem-and-leaf diagram shows the results for Class P.

Class P

1	3	4	6	7	
2	0	5	5	7	9
3	1	5	6	7	
4	2	8	8		

Key:
4 | 2 represents a time of 42 seconds

(a) Complete these sentences.

The shortest time for Class P is ..... seconds.

The longest time for Class P is ..... seconds.

..... % of the times for Class P are longer than 36 seconds.

[2]

(b) Class P have more consistent times than Class Q.

Write a possible value for the range of times for Class Q.

..... seconds [1]

(c) The median time for Class Q is 34 seconds.

Using this result, write a comparison between the times for Class P and Class Q.
You must use data to support your comparison.

.....

..... [2]

21 Solve.

$$10(2x - 3) = 133 - 2(x - 1)$$

$x =$ ..... [3]

22 A wheel on Eva's bicycle has radius 311 mm.
The wheel makes 15 complete revolutions as she travels in a straight line.

Calculate the distance Eva travels.
Give your answer in **metres** correct to one decimal place.

..... m [4]